

Replace paragraph beginning at page 6, line 10 with the following rewritten paragraph:

22 --The flange 21 advantageously increases the creepage distance between the two windings 51, 52 at regions of the transformer 100. Lengthening the creepage path (i.e., the path across the surface of a dielectric between two conductors) reduces the possibility of damage due to, e.g., arcing between the windings on the first and second bobbin members 40, 20. In the transformer 100 shown in FIG. 1, for example, the creepage path begins at the winding 52 on the second bobbin member 20, passes outwardly across the lower surface of the wall 27, up the face of the flange portion 21(a), down the opposite face of the flange portion 21(a), across the upper surface of the wall 27, and to the coil 51 on the first bobbin member 40. In embodiments of the invention, the creepage distance can be increased without increasing the length or width of the walls of the first and second bobbin members 40, 20.--

Replace paragraph beginning at page 7, line 5 with the following rewritten paragraph:

23 --A core 70 such as a ferrite core passes through the first and second hollow portions of the first and second bobbin members 40, 20. The core 70 may be formed from portions having any suitable shape. For example, the core 70 may be formed by using two U-shaped core portions coupled together to form a ring. Alternatively, the core 70 may be formed by coupling a U-shaped core portion and an I-shaped bar to form a ring. The core may also be formed from E-shaped core portions. For example, the core 70 may include two E type core portions coupled together or an E and an I type core coupled together.--

Replace paragraph beginning at page 7, line 12 with the following rewritten paragraph:

24 --The core 70 may have a potential which is between (e.g., halfway between) the potentials of the windings 51, 52 on the first and second bobbin members 40, 20. In preferred embodiments, the first and second bobbin members 40, 20 may also include additional flanges to increase the creepage distance between the core 70 and the windings 51, 52 on respective bobbin members 40, 20. For example, the first bobbin member 40 may include a flange 43 which increases the creepage distance between the winding 51 on the first bobbin member 40, and the core 70. In this example, the flange 43 may have a number of flange portions and these flange portions may be closely adjacent the core 70 to shield portions of the core 70 from the winding 51. Preferably, the flange 43 conforms to the outer surface of the core 70. In the example shown in FIG. 1, the flange portions are on a wall 46 of the first bobbin member 40 and are perpendicular to the wall 46 --

Replace paragraph beginning at page 7, line 23 with the following rewritten paragraph:

85 --Preferably, as shown in FIG. 1, a flange portion 21(b) of the second bobbin member can extend beyond the back of the winding (e.g., a primary winding) 51 on the first bobbin member 40. Alternatively or additionally, a flange portion 21(a) of the second bobbin member can extend beyond the side of the winding 51. Extra creepage distance is provided by these flange portions and the transformer height can be reduced. If desired, the creepage distance between elements in the transformer may be increased in other ways. For example, the walls of the first and second bobbin members can be made wider to increase the creepage distance between respective windings on the first and second bobbin members 40, 20. In another example, additional flanges may be present on the walls of the bobbin members. For example, flanges may be on the outer walls 26, 46 of the first and second bobbin members 40, 20 at the core side of the transformer on either or both sides of the core 70. This could result in a slight increase in the height of the core, but can make the transformer narrower. This may be particularly useful for EE or EI type cores.--

Replace paragraph beginning at page 8, line 13 with the following rewritten paragraph:

46 --FIG. 2 shows another view of the transformer 100. In FIG. 2, the outer surface of the second bobbin member 20 is shown more clearly. The second bobbin member 20 includes pins 92 which are electrically coupled to the winding on the second bobbin member 20. A flange 23 may be present on the outer wall 26 of the second bobbin member 20. The flange 23 may be disposed adjacent to the core 70 to increase the creepage distance between the winding on the second bobbin member 20 and the core 70. Ribs 24 may be present to provide structural support for the flange 23 disposed around the core 70. The ribs 24 also increase the creepage distance between the windings on the first and second bobbin members 40, 20, especially the portions of the windings exposed by the slots between the pin supports 95. In this example, the first bobbin member 40 may include a recess 81 (e.g., a slot) for receiving a printed circuit board.--

Replace paragraph beginning at page 9, line 7 with the following rewritten paragraph:

47 --FIGS. 4 and 5 show exploded views of a preferred transformer embodiment. As shown in these Figures, a conductive layer 90 may optionally be provided between the first and second bobbin members 40, 20 of the transformer 100 before they are fitted together. The conductive layer 90 can be in the form of a ring and may be a Faraday shield. Typically, the conductive layer 90

comprises a flat copper shield. The conductive layer 90 may include a tab 99, which may be bent over and may be electrically coupled to one of the pins (e.g., a ground pin) on the first bobbin member 40. Conductive charge can be removed from the region between the windings of the first and second bobbin members by using the conductive layer 90. Charge can pass to the conductive layer 90, through the tab 99 and to a pin coupled to the tab 99. Advantageously, the thickness of the walls of the first and second bobbin members 40, 20 can be reduced by using the conductive layer 90 between the bobbin members 40, 20. Minimizing the wall thickness reduces any undesirable leakage inductance between the windings on the first and second bobbin members. Also, by minimizing the wall thickness, the height of the resulting transformer 100 can be reduced. The design also allows for the removal of a Y-capacitor (see e.g., FIG. 17) which might otherwise be needed. This is because the common mode EMI is significantly reduced by the presence of the EMI shield.--

Replace paragraph beginning at page 9, line 23 with the following rewritten paragraph:

--With reference to FIGS. 4 and 5, the core 70 may include two core portions 70(a), 70(b). In this example, both core portions 70(a), 70(b) are U-shaped. When the ends of the U-shaped core portions are joined together, they form a ring. One end of the ring passes through hollow portions in the first and second bobbin members 40, 20, while the other end of the ring is outside of the first and second bobbin members 40, 20.--

Replace paragraph beginning at page 10, line 12 with the following rewritten paragraph:

--The second body portion 29 is preferably adapted to receive, and is preferably cooperatively arranged with, a tubular portion 49 on the first bobbin member 40 (see FIG. 7). For example, the second body portion 29 may be, for example, in the form of a cylinder which has a wider diameter than a cylindrical tubular portion 49. The tubular portion 49 of the first bobbin member 40 can be inserted within the hollow region of the second body portion 29 so that the first and the second bobbin members 40, 20 are coupled together. Advantageously, the first and the second bobbin members 40, 20 may be coupled together without the need to use a shroud to hold the first and second bobbin members together. Since a shroud can be excluded in preferred embodiments of the invention, the size of the transformer can be reduced by the space which might otherwise be taken up by the shroud. Moreover, the tubular portion 49 can increase the creepage distance between a conductive layer (e.g., a Faraday shield) between the first and second bobbin

members, and the core passing through the bobbin member.--

Replace paragraph beginning at page 11, line 13 with the following rewritten paragraph:

A10  
--As noted above, portions of the first and second bobbin members 40, 20 may be cooperatively structured so that the first and second bobbin members 40, 20 can be joined together. Exemplary cooperative structures are shown in FIGS. 10 and 11. FIGS. 10 and 11 show a first bobbin member 40 and a second bobbin member 20. The second bobbin member 20 includes a second body portion 29 including two sections 29(a), 29(b) which form a recess. The walls 26, 27 of the second bobbin member 20 are axially spaced from each other (e.g., with respect to the axis 105) and extend away from the second body portion 29 in a radial direction. The first bobbin member 40 includes a first body portion 45 coupled to a pair of walls 46, 47. The walls 46, 47 extend away from the first body portion 45 in a radial direction and are axially spaced from one another. A portion of a ring-shaped core 70 is disposed within hollow regions of the first and second body portions 29, 45, while an opposing portion of the core 70 extends past the outer edges of the walls 26, 27, 46, 47. A flange portion 21(b) is on a wall 27 of the second bobbin member 20 and extends away from the other wall 26 of the second bobbin member 20. The flange portion 21(b) partially encloses the first bobbin member 40 and the winding (not shown) thereon.--

Replace paragraph beginning at page 12, line 12 with the following rewritten paragraph:

A11  
--Specific features of the cooperatively structured portions of the first and second bobbin members are more clearly shown in FIGS. 12 and 13. The first bobbin member 40 includes a tubular portion 49 including a ledge 49(a). The second bobbin member 20 includes a second body portion 29 with sections 29(a), 29(b) forming a recess. The recess receives the tubular portion 49 of the first bobbin member 40. When the first and second bobbin members 40, 20 are coupled together, the ledge 49(a) can abut an inner section 29(b) of the second body portion 29 of the second bobbin member 20.--

Replace paragraph beginning at page 12, line 19 with the following rewritten paragraph:

A12  
--The cooperatively arranged structures shown in FIGS. 10 to 13 are especially suitable for increasing the creepage distance from, e.g., the core and a conductive layer (e.g., a Faraday shield) disposed between the first and second bobbin members 40, 20. For instance, with reference to FIG. 10, the creepage path between the core portion along the axis 105 and the conductive layer 90